

*MUHLENBERGIA ALOPECUROIDES* (POACEAE: MUHLENBERGIINAE),  
A NEW COMBINATION

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ABSTRACT

A new combination, *Muhlenbergia alopecuroides* (Griseb.) P. M. Peterson & Columbus, is made based on published and ongoing molecular phylogenetic studies.

RESUMEN

Se propone una nueva combinación, *Muhlenbergia alopecuroides* (Griseb.) P. M. Peterson & Columbus, basada en estudios filogenéticos moleculares publicados y en curso.

Key Words: *Lycurus setosus*, *Muhlenbergia alopecuroides*, Muhlenbergiinae, Poaceae, taxonomy.

The grass subtribe Muhlenbergiinae (Chloridoideae: Cynodonteae) recently has comprised 10 genera: *Aegopogon* Humb. & Bonpl. ex Willd., *Bealia* Scribn., *Blepharoneuron* Nash, *Chaboissaea* E. Fourn., *Lycurus* Kunth, *Muhlenbergia* Schreb., *Pereilema* J. Presl, *Redfieldia* Vasey, *Schaffnerella* Nash, and *Schedonnardus* Steud. (Duvall et al. 1994; Peterson 2000; Peterson et al. 1995, 1997, 2001a, 2007). Members of Muhlenbergiinae are characterized by ligules usually membranous and eciliate; the inflorescence rebranched or of spicate primary branches, branch axes persistent or falling entire; spikelets bisexual, staminate, or sterile, solitary, rarely paired or in triplets, occasionally secund, glumes awned or unawned, floret usually 1; lemmas 3-nerved, awned or unawned; cleistogenes occasionally present in the leaf sheaths; and a base chromosome number of  $x = 8-10$ .

A phylogenetic study of Chloridoideae based on *trnL-F* (cpDNA) and ITS (nrDNA) sequences (Columbus et al. 2007) has revealed that Muhlenbergiinae are monophyletic but *Muhlenbergia* is paraphyletic with respect to the other genera in the subtribe. We and colleagues are conducting a phylogenetic study focused on Muhlenbergiinae in which all species are targeted for sequencing. *TrnL-F* and ITS sequences from most species have been obtained and analyzed (J. T. Columbus et al. unpubl. data). The monophyly of Muhlenbergiinae and paraphyly of *Muhlenbergia* are consistent outcomes in all analyses of this large and expanding data set (Peterson et al. 2001b, 2004). We are proposing taxonomic

changes based on these results. Herein, in preparation for the second edition of The Jepson Manual (Baldwin et al. in prep.), we transfer *Lycurus setosus* (Nutt.) C. Reeder, which was sampled in the Columbus et al. (2007) study, to *Muhlenbergia*.

***Muhlenbergia alopecuroides*** (Griseb.) P.M. Peterson & Columbus, comb. nov. *Lycurus alopecuroides* Griseb., Abh. Königl. Ges. Wiss. Göttingen 19:255–256. 1874. Type: Argentina, Prov. Catamarca, ca. Belén, en el altivalle de Las Granadillas, Feb 1872, *P. G. Lorentz s.n.* (Holotype: GOET; Isotypes: BA!, BAA!, CORD!, SI!, US-996080 fragm. ex GOET!).

*Pleopogon setosum* Nutt., Proc. Acad. Nat. Sci. Philadelphia 4:25. 1848. *Lycurus setosus* (Nutt.) C. Reeder, Phytologia 57:287. 1985. Type: U.S.A., New Mexico, Santa Fe Co., mountains near Santa Fe, 1841 or 1842, *W. Gambel s.n.* (Holotype: K; Isotypes: PH, US-610839 fragm. ex K!).

*Comments.* The new combination cannot be based on the basionym *Pleopogon setosum* because the epithet in *Muhlenbergia* [as *M. setosa* (Kunth) Trin.] was previously used. Therefore, we are using the next available name, *Lycurus alopecuroides*, as the basis for the new combination.

In California, there are 19 species of *Muhlenbergia* including *M. alopecuroides* (Peterson 1993, 2002, in press). In the first edition of The Jepson Manual (Hickman 1993), *M. alopecuroides* was mistakenly treated as *Lycurus phleoides* Kunth instead of *L. setosus* (Smith 1993, 2002). *Muh-*

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*lenbergia alopecuroides* can be distinguished from *L. phleoides* by having leaf blades with fragile, awnlike tips (3–4–7(–12) mm long (blades acute or with bristles 1–3 mm long in *L. phleoides*) and longer ligules that are (2–)3–10(–12) mm long (ligules 1.5–3 mm long in *L. phleoides*) [Reeder 2003]. *Muhlenbergia alopecuroides* has an amphitropical distribution, occurring in the southwestern United States, northern Mexico, southern Bolivia, and northern Argentina. Based on allozyme variation, it seems likely that the species recently dispersed to South America because populations there contain less genetic variation (Peterson and Morrone 1998; Peterson 2000).

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#### LITERATURE CITED

- BALDWIN, B. G., S. BOYD, B. J. ERTTER, D. J. KEIL, R. W. PATTERSON, T. J. ROSATTI, AND D. H. WILKEN (eds.). In prep. The Jepson manual of higher plants of California, 2nd edition. University of California Press, Berkeley, CA.
- COLUMBUS, J. T., R. CERROS-TLATILPA, M. S. KINNEY, M. E. SIQUEIROS-DELGADO, H. L. BELL, M. P. GRIFFITH, AND N. F. REFULIO-RODRIGUEZ. 2007. Phylogenetics of Chloridoideae (Gramineae): a preliminary study based on nuclear ribosomal internal transcribed spacer and chloroplast *trnL-F* sequences. *Aliso* 23:565–579.
- DUVALL, M. R., P. M. PETERSON, AND A. H. CHRISTENSEN. 1994. Alliances of *Muhlenbergia* (Poaceae) within New World Eragrostideae are identified by phylogenetic analysis of mapped restriction sites from plastid DNAs. *American Journal of Botany* 81:622–629.
- HICKMAN, J. C. (ed.). 1993. The Jepson manual: higher plants of California. University of California Press, Berkeley, CA.
- PETERSON, P. M. 1993. *Muhlenbergia*. Pp. 1272–1274 in J. C. Hickman (ed.). The Jepson manual: higher plants of California. University of California Press, Berkeley, CA.
- . 2000. Systematics of the Muhlenbergiinae (Chloridoideae: Eragrostideae). Pp. 195–212 in S. W. L. Jacobs and J. Everett (eds.). Grasses: systematics and evolution. CSIRO, Melbourne.
- . 2002. *Muhlenbergia*. Pp. 586–588 in B. G. Baldwin, S. Boyd, B. J. Ertter, R. W. Patterson, T. J. Rosatti, and D. H. Wilken (eds.). The Jepson desert manual: vascular plants of Southeastern California. University of California Press, Berkeley, CA.
- . In press. *Muhlenbergia*. in B. G. Baldwin, S. Boyd, B. J. Ertter, D. J. Keil, R. W. Patterson, T. J. Rosatti, and D. H. Wilken (eds.). The Jepson manual of higher plants of California, 2nd edition. University of California Press, Berkeley, CA.
- , J. T. COLUMBUS, R. CERROS T., AND M. S. KINNEY. 2001b. Phylogenetics of *Muhlenbergia* and relatives (Poaceae: Chloridoideae) based on internal transcribed spacer region sequences (nrDNA). Botany 2001 Abstract available at: [www.botany2001.org/section12/abstracts/33.shtml](http://www.botany2001.org/section12/abstracts/33.shtml)
- , ———, N. F. REFULIO-RODRIGUEZ, R. CERROS-TLATILPA, AND M. S. KINNEY. 2004. A phylogeny of the Muhlenbergiinae (Poaceae: Chloridoideae: Cynodonteae) based on ITS and *trnL-F* sequences. Botany 2004 Abstract available at: [www.2004.botanyconference.org/engine/search/index.php?func=detail&aid=38](http://www.2004.botanyconference.org/engine/search/index.php?func=detail&aid=38)
- , ———, AND S. J. PENNINGTON. 2007. Classification and biogeography of New World grasses: Chloridoideae. *Aliso* 23:580–594.
- AND O. MORRONE. 1998. Allelic variation in the amphitropical disjunct *Lycurus setosus* (Poaceae: Muhlenbergiinae). *Madroño* 44:334–346.
- AND R. J. SORENG. 2007. Systematics of California grasses (Poaceae). Pp. 7–20 in M. R. Stromberg, J. D. Corbin, and C. M. D'Antonio (eds.). Ecology and management of California grasslands. University of California Press, Berkeley, CA.
- , ———, G. DAVIDSE, T. S. FILGUEIRAS, F. O. ZULOAGA, AND E. J. JUDZIEWICZ. 2001a. Catalogue of New World grasses (Poaceae): II. Subfamily Chloridoideae. Contributions from the United States National Herbarium 41:1–255.
- , R. D. WEBSTER, AND J. VALDÉS-REYNA. 1995. Subtribal classification of the New World Eragrostideae (Poaceae: Chloridoideae). *Sida* 16:529–544.
- , ———, AND ———. 1997. Genera of New World Eragrostideae (Poaceae: Chloridoideae). *Smithsonian Contributions to Botany* 87:1–50.
- REEDER, C. G. 2003. *Lycurus*. Pp. 200–203 in M. E. Barkworth, K. M. Capels, S. Long, and M. B. Piep (eds.). Magnoliophyta: Commelinidae (in part): Poaceae, part 2. Flora of North America north of Mexico, volume 25. Oxford University Press, New York, NY.
- SMITH, J. P. JR. 1993. *Lycurus*. Pp. 1270 in J. C. Hickman (ed.). The Jepson manual: higher plants of California. University of California Press, Berkeley, CA.
- . 2002. *Lycurus*. Pp. 584 in B. G. Baldwin, S. Boyd, B. J. Ertter, R. W. Patterson, T. J. Rosatti, and D. H. Wilken (eds.). The Jepson desert manual: vascular plants of Southeastern California. University of California Press, Berkeley, CA.